CIVIL-TECH CONSULTANTS AND ENGINEERS

Building & Highway Material Testing Laboratory

An ISO 9001:2008 Certified Company

JAS-ANZ BSCIC ISO 9001 REGISTERED

Job No.: CTCE/BBMP/W.No.12/KRIDL/WBM-II/2013-14

Date: 08.05.2013

REPORT

Client	:	**Asst. Executive Engineer,** Shettyhalli Sub Division, Dasarahalli Zone, BBMP, Bangalore.
Agency	:	**Technical Manager (West),** KRIDL, Bangalore.
Name of the Work	:	Improvements to cross and main road at Shettyhalli Gate Palya, Shettyhalli Sub Division in Ward No. 12, BBMP, Bangalore.
Reference	:	BBMP/AEE/SSD/DZ/PR/2012-13
Type of Mix	:	Water Bound Macadam (Grade-II Metal)
Date of Sampling	:	06.05.2013
Date of Testing	:	08.05.2013

1) SEIVE ANALYSIS :

IS Sieve design ation Size, mm	Percentage Passing for Graded Aggregate of Nominal size	Percentage by Weight Passing as per MORTH table 400-7
90mm	100.00	100.00
63mm	93.54	90-100
53mm	28.79	25-75
45mm	8.51	0-15
22.4mm	2.23	0-5

Note:

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AE W-12

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ದಾಸರಹಳ್ಳಿ ಉಪವಿಭಾಗ, ದಾಸರಹಳ್ಳಿ ಪುಲಯ.
ಬೃಹತ್ ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ

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Bangalore - 560 079

Job No.: CTCE/BBMP/W.No.12/KRIDL/WBM/AIV/2013-14 08.05.2013

Aggregate Impact Value

IS: 2386 Part IV

Client	**Asst. Executive Engineer,** Shettyhalli Sub Division, Dasarahalli Zone, BBMP, Bangalore.
Agency	**Technical Manager (West),** KRIDL, Bangalore.
Name of the Work	Improvements to cross and main road at Shettyhalli Gate Palya, Shettyhalli Sub Division in Ward No. 12, BBMP, Bangalore.
Reference	BBMP/AEE/SSD/DZ/PR/2012-13
Source / Location	WBM Mix Plant, Bangalore
Type of Mix	Water Bound Macadam
Date of Testing	08.05.2013

Sl No.	Details	Trial No. 1	Trial No. 2	Trial No. 3	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	386	390	389	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	84	86	88	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	302	304	301	
4	Aggregate Impact value = percent fines	21.76	22.05	22.62	
	100* (W_2/W_1)%				22.15

Comments:

→ Maximum allowable Aggregate Impact value for Water Bound Macadam is 30%

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08.05.2013

CIVIL ENGINEERING TESTING LABORATORY www.civiltechconsultants.com

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	**Asst. Executive Engineer,** Shettyhalli Sub Division, Dasarahalli Zone, BBMP, Bangalore.
Agency	**Technical Manager (West),** KRIDL, Bangalore.
Name of Work	Improvements to cross and main road at Shettyhalli Gate Palya, Shettyhalli Sub Division in Ward No. 12, BBMP, Bangalore.
Reference	BBMP/AEE/SSD/DZ/PR/2012-13
Technical Reference	IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	Water Bound Macadam (Grade-II Metal)
Date of Testing	08.05.2013

Passing through IS Sieve, mm	Retained On IS Sieve, mm	Weight of Sieved Fraction (W) gms		Proportion of Size range in the sample, X = 100xW/ΣW		Weight of 200 pieces of aggregates of the range, (P) in gms		Thickness gauge size, mm	Weight of flaky particles (F)in gms		Percentage by Weight of flaky aggregates in gms Y= 100xF/P	Weighed Percentage of flaky aggregates in gms XY=X × Y	Weight of fraction consisting of at least 200 Pieces in gms		Length gauge size in mm	Weight of aggregates in each fraction retained on Length gauge in gms	
63.00	50.00	W1		X1		P1		33.90	F1				P1		-	E1	
50.00	40.00	W2	2896	X2	19.27	P2	2755	27.00	F2	389	14.12	272.08	P2	2755	81.00	E2	296
40.00	31.50	W3	2679	X3	17.83	P3	2566	21.50	F3	378	14.73	262.59	P3	2566	58.00	E3	249
31.50	25.00	W4	2537	X4	16.88	P4	2384	16.95	F4	309	12.96	218.80	P4	-	-	E4	-
25.00	20.00	W5	2235	X5	14.87	P5	[illegible]	13.50	F5	[illegible]	12.26	182.34	P5	2145	40.50	E5	214
20.00	16.00	W6	1958	X6	13.03	P6	1558	10.80	F6	199	12.77	166.41	P6	1558	32.40	E6	182
16.00	12.50	W7	1245	X7	8.28	P7	902	8.55	F7	158	17.52	145.11	P7	902	25.50	E7	167
12.50	10.00	W8	856	X8	5.70	P8	658	6.75	F8	84	12.31	70.11	P8	658	20.20	E8	92
10.00	6.30	W9	623	X9	4.15	P9	535	4.89	F9	63	10.28	42.62	P9	535	14.70	E9	84
		ΣW	15029.0									ΣXY 1360.05	ΣP	11119.0		ΣE	1284.0

Result : Flakiness Index = **13.60%**

Elongation Index = **11.55%**

Result: Combined Flakiness & Elongation index **25.15%**

Note:

The results indicated above are based on the tests carried out on the samples received in the laboratory.

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Job No.: CTCE/BBMP/W.No.12/KRIDL/WBM-II/2013-14

Date: 08.05.2013

REPORT

Client	:	**Asst. Executive Engineer,** Shettyhalli Sub Division, Dasarahalli Zone, BBMP, Bangalore.
Agency	:	**Technical Manager (West),** KRIDL, Bangalore.
Name of the Work	:	Improvements to cross and main road at Shettyhalli Gate Palya, Shettyhalli Sub Division in Ward No. 12, BBMP, Bangalore.
Reference	:	BBMP/AEE/SSD/DZ/PR/2012-13
Type of Mix	:	Water Bound Macadam (Grade-II Metal)
Date of Sampling	:	06.05.2013
Date of Testing	:	08.05.2013

Table-1

Tests on Filler Screen Material (Gravel) (As per MORTH Clause 404.2.6)

Sl. No	Particulars	Test Results	Standards as per MORTH
1.	Liquid Limit, %	15.85	20.0% Maximum.
2.	Plasticity Index, %	Non Plastic	6.0% Maximum.
3	% Finer than 75micron	6.45	10.0% Maximum.

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Job No.: CTCE/BBMP/W.No.12/KRIDL/WBM-III/2013-14

Date: 08.05.2013

REPORT

Client	:	**Asst. Executive Engineer,** Shettyhalli Sub Division, Dasarahalli Zone, BBMP, Bangalore.
Agency	:	**Technical Manager (West),** KRIDL, Bangalore.
Name of the Work	:	Improvements to cross and main road at Shettyhalli Gate Palya, Shettyhalli Sub Division in Ward No. 12, BBMP, Bangalore.
Reference	:	BBMP/AEE/SSD/DZ/PR/2012-13
Type of Mix	:	Water Bound Macadam (Grade-III Metal)
Date of Sampling	:	06.05.2013
Date of Testing	:	08.05.2013

1) SEIVE ANALYSIS:

IS Sieve designation Size,mm	Percentage Passing for Graded Aggregate of Nominal size	Percentage by Weight Passing as per MORTH table 400-7
63mm	100.00	100.00
53mm	97.73	95-100
45mm	68.34	65-90
22.4mm	6.26	0-10
11.2mm	1.81	0-5

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08.05.2013

Aggregate Impact Value

IS: 2386 Part IV

Client	**Asst. Executive Engineer,** Shettyhalli Sub Division, Dasarahalli Zone, BBMP, Bangalore.
Agency	**Technical Manager (West),** KRIDL, Bangalore.
Name of the Work	Improvements to cross and main road at Shettyhalli Gate Palya, Shettyhalli Sub Division in Ward No. 12, BBMP, Bangalore.
Reference	BBMP/AEE/SSD/DZ/PR/2012-13
Source / Location	WBM Mix Plant, Bangalore
Type of Mix	Water Bound Macadam
Date of Testing	08.05.2013

Sl No.	Details	Trial No. 1	Trial No. 2	Trial No. 3	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	384	387	389	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	82	84	86	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	302	303	303	
4	Aggregate Impact value = percent fines	21.35	21.71	22.11	
	100* (W_2/W_1)%				21.72

Comments:

→ Maximum allowable Aggregate Impact value for Water Bound Macadam is 30%

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DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

CIVIL ENGINEERING TESTING LABORATORY www.civiltechconsultants.com

Client	**Asst. Executive Engineer,** Shettyhalli Sub Division, Dasarahalli Zone, BBMP, Bangalore.
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Name of Work	Improvements to cross and main road at Shettyhalli Gate Palya, Shettyhalli Sub Division in Ward No. 12, BBMP, Bangalor
Reference	BBMP/AEE/SSD/DZ/PR/2012-13
Technical Reference	IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	Water Bound Macadam (Grade-III Metal)
Date of Testing	08.05.2013

Passing through IS Sieve, mm	Retained On IS Sieve, mm	Weight of Sieved Fraction (W) gms		Proportion of Size range in the sample, X = 100xW/ΣW		Weight of 200 pieces of aggregates of the range, (P) in gms		Thickness gauge size, mm	Weight of flaky particles (F)in gms		Percentage by Weight of flaky aggregates in gms Y= 100xF/P	Weighed Percentage of flaky aggregates in gms XY=X × Y	Weight of fraction consisting of at least 200 Pieces in gms		Length gauge size in mm	Weight of aggregates in each fraction retained on Length gauge in gms	
63.00	50.00	W1		X1		P1		33.90	F1				P1		-	E1	
50.00	40.00	W2	2917	X2	19.81	P2	2858	27.00	F2	361	12.74	252.35	P2	2858	81.00	E2	281
40.00	31.50	W3	2851	X3	19.39	P3	2659	21.50	F3	362	13.61	263.92	P3	2659	58.00	E3	252
31.50	25.00	W4	2568	X4	17.44	P4	2458	16.95	F4	341	13.47	234.90	P4	-	-	E4	-
25.00	20.00	W5	2159	X5	14.67	P5	2255	13.50	F5	312	13.84	202.91	P5	2255	40.50	E5	218
20.00	16.00	W6	1899	X6	12.90	P6	1667	10.80	F6	191	11.46	147.79	P6	1667	32.40	E6	193
16.00	12.50	W7	1012	X7	6.87	P7	959	8.55	F7	152	15.85	108.95	P7	959	25.50	E7	161
12.50	10.00	W8	759	X8	5.16	P8	684	6.75	F8	86	12.57	64.82	P8	684	20.20	E8	94
10.00	6.30	W9	554	X9	3.76	P9	253	4.89	F9	71	28.06	105.60	P9	253	14.70	E9	75
		Σ W	14722.0									ΣXY 1381.25		ΣP 11335.0			ΣE 1274.0

Flakiness Index = 13.81%

Elongation Index = 11.24%

Result : Combined Flakiness & Elongation index 25.05%

Note:

The results indicated above are based on the tests carried out on the samples received in the laboratory.

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REPORT

Client	:	**Asst. Executive Engineer,** Shettyhalli Sub Division, Dasarahalli Zone, BBMP, Bangalore.
Agency	:	**Technical Manager (West),** KRIDL, Bangalore.
Name of the Work	:	Improvements to cross and main road at Shettyhalli Gate Palya, Shettyhalli Sub Division in Ward No. 12, BBMP, Bangalore.
Reference	:	BBMP/AEE/SSD/DZ/PR/2012-13 Dated: 04.02.2013
Type of Mix	:	Water Bound Macadam (Grade-III Metal)
Date of Sampling	:	06.05.2013
Date of Testing	:	08.05.2013

Tests on Filler Screen Material (Gravel) (As per MORTH Clause 404.2.6)

Sl. No	Particulars	Test Results	Standards as per MORTH
1.	Liquid Limit, %	13.50	20.0% Maximum.
2.	Plasticity Index, %	Non Plastic	6.0% Maximum.
3	% Finer than 75micron	7.15	10.0% Maximum.

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